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EXAMINER

NAFF, DAVID M

ART UNIT PAPER NUMBER

1651

DATE MAILED: 09/23/2003

11

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/890401

Applicant(s)

Marcher def

Examiner

Moff

Group Art Unit

1657

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 6/17/03
- ☒ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-99 is/are pending in the application.
- Of the above claim(s) 21-50 + 71-99 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-20 + 51-70 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
 - ☐ received in Application No. (Series Code/Serial Number) _____
 - ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Interview Summary, PTO-413
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

Office Action Summary

The response of 6/17/03 presented arguments and did not amend the claims.

Claims 21-50 and 71-99 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made without traverse in Paper No. 7 (filed 10/30/02).

Claims examined on the merits are 1-20 and 51-70.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10 ***Claim Rejections - 35 USC § 103***

Claims 1-20 and 51-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naughton et al (5,541,107) in view of Sussman et al (5,266,476) and Stephanopoulos et al (5,510,262).

15 Claims 1-20 are drawn to a method of expanding/maintaining undifferentiated hemopoietic stem cells or progenitor cells by seeding the cells into a stationary phase plug-flow bioreactor in which a three-dimensional stromal cell culture has been pre-established on a non-woven fibrous matrix in the form of a sheet, and expanding/maintaining the stem cells or progenitor cells.

20 Claims 51-70 require a method of transplanting undifferentiated hemopoietic stem cells or progenitor cells resulting from expanding/maintaining the cells by the method of claims 1-20.

Naughton et al disclose growing stromal cells on a three-dimensional matrix which can be formed from a polymeric material to produce a three-dimensional stromal matrix (col 9, lines 16-20 and 49-51 and col 13, lines 8-14), inoculating the stromal matrix with stem

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cells (col 15, lines 41 and 57 and col 21, lines 3, 9, and 26) such as hematopoietic stem cells (col 21, line 3), maintaining the stem cells on the matrix *in vitro* where proliferation of the cells is maximized (col 21, lines 2-3), and implanting the stem cells *in vivo* to

- 5 repopulate bone marrow (col 16, lines 58-67 and col 21, lines 4-5).
Sussman et al disclose a fibrous matrix for cell cultivation.

The matrix can be a non-woven fiber sheet (col 4, line 56), and can have a pore volume of 40-90%, a pore size of 10-100 μ m, a height of 50-500 μ m, and a fiber diameter of 0.5-50 μ m (col 2, lines 47-65).

- 10 Matrix sheets can be used as a packing in a column (paragraph bridging cols 7 and 8), and the matrix can be coated with poly-D-lysine (col 13, line 68).

- Stephanopoulos et al disclose a cell-culturing reactor having an inlet and outlet for culture medium and containing a macroporous
15 support between the inlet and outlet having pores of a size that allows cells to collect within the pores and oxygen and nutrients to migrate into the pores for consumption by the cells (paragraph bridging cols 2 and 3).

- It would have been obvious to use as the matrix of Naughton et al
20 the non-woven fibrous sheet packed in a column for cell culture disclosed by Sussman et al to obtain a flow through reactor having an inlet and outlet as suggested by Sussman et al and Stephanopoulos et al since such a reactor would have been expected to provide advantages of a beneficial environment for cell culture and continuous flow.

Response to Arguments

Applicants urge that Naughton et al is not limited to differentiationless stem cell expansion. However, Naughton et al disclose implanting the stem cells after proliferation, and there is
5 no disclosure of the cells differentiating prior to implanting. The present claims require no conditions unobviously different from Naughton et al that would maintain the cells differentiationless. Merely growing the cells in a reactor as claimed would not appear to keep the cells from differentiating. The differentiation of Naughton
10 et al at col 21, lines 21-28, is after implanting and not before implanting. The disclosure in the present specification at page 15, lines 20-28, refers to a previous procedure described which is not required by the present claims.

THIS ACTION IS MADE FINAL. Applicant is reminded of the
15 extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after
20 the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX
25 MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 703-308-0520. The examiner can normally be reached on Monday-Friday 9:30-6:00.

5 If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 703-308-4743. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

10 Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

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David M. Naff
Primary Examiner
Art Unit 1651

DMN
9/22/03